

EXHIBIT 63



DEPARTMENT OF PURCHASES AND SUPPLIES

Dayne Walling
Mayor

Derrick F. Jones
Purchasing Manager

INVITATION TO BID

OWNER:

THE CITY OF FLINT
DEPARTMENT OF PURCHASES AND SUPPLIES
1101 S. SAGINAW ST., 3RD FLOOR
FLINT, MI 48502

PROPOSAL NO.: 15-573

SCOPE OF WORK:

The City of Flint (The City), Department of Purchases & Supplies, is soliciting sealed proposals for the following:

Water Quality Consultant

per the attached specification.

If your firm is interested in providing the requested services, please submit 1 original and 2 copies of your detailed proposal to the City of Flint, Department of Purchases and Supplies, 1101 S. Saginaw St. Rm. 304, Third Floor, Flint, MI, 48502, by **Monday, January 26, 2015 @ 12:00 PM (EST)**. Please note: all detailed proposals received after 12:00 PM (EST) will not be considered. Faxed proposals into the Purchasing Department are not accepted.

The City of Flint may hold proposals for a period of 120 days from opening, for the purpose of reviewing the results and investigating the qualifications of proposals prior to making an award. The City of Flint reserves the right to waive any irregularities and accept or reject any or all proposals submitted. Vendors located within the corporate city limits of Flint, Michigan may be given a seven percent (7%) competitive price advantage. Additionally, if the lowest responsible bidder is not located within the limits of the City of Flint, but is located within the county of Genesee, and said Genesee County responsible bidder does not exceed the bid of the lowest non-local bidder by more than three and one-half percent (3 ½ %), the County vendor may have a competitive advantage.

The City reserves the right to waive any irregularities and accept or reject any or all

* CITY HALL 1101 S. SAGINAW STREET FLINT, MICHIGAN 48502 (810) 766-7340 FAX (810) 766-7240 *

proposals submitted.

The City is an equal opportunity employer.

The successful bidder must comply with all requirements and pay prevailing wages and fringe benefits on this project per the City's Resolution R-12 adopted 4/8/91.

Pursuant to the requirements of 1976 P.A. 453 (Michigan Civil Rights Act) and 1976 P.A. 220 (Michigan Handicapped Rights Act), the local unit and its agent agree not to discriminate against any employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment or a matter directly or indirectly related to employment because of race, color, religion, national origin, age, sex, height, weight, marital status or because of a handicap that is unrelated to the person's ability to perform the duties of nondiscrimination provision identical to this provision and binding upon any and all contractors and subcontractors. A breach of this covenant shall be regarded as a material breach of this contract.

All materials furnished must be new, of latest model and standard first grade quality, or best workmanship and design, unless otherwise expressly specified. Bidder, if required, must furnish satisfactory evidence of quality materials, offers of experimental or unproven equipment may be disregarded.

Bidder shall protect against expense of any nature, shall bear costs of any suits which arise, and shall pay all damages which may be awarded against the City for the use, under this specification, of any patented device, process, apparatus, material or invention.

Bidder is not permitted to take advantage of any obvious errors or omissions in specifications.

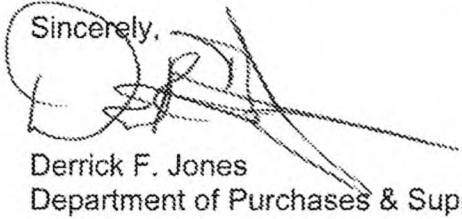
The City reserves the right to reject any or all bids, or split awards by items, unless otherwise stipulated, or to accept any bid which will best serve its interests.

The Director shall not knowingly accept a proposal from a vendor /contractor who is in default on the payment of taxes, licenses, fees or other monies due the City. Purchase agreements with bidders who are found to have been in default at the time of award of such agreement shall be voided.

The bidder acknowledges that by signing this document that he/she is duly authorized to make said offer on behalf of the company he/she represents and that said proposal is genuine and not sham or collusive and not made in the interests or on behalf of any person not therein named, and that he/she and said bidder have not directly induced or solicited any other person(s) or corporation to refrain from responding to this solicitation and that he/she and said bidder have not in any manner sought by collusion to secure to himself/herself and said bidder any advantage over any other bidder.

Any questions regarding this proposal should be submitted by either fax (810-766-7240) or e-mail djones@cityofflint.com by Tuesday, January 20, 2015 by 5:00 PM. Responses to any questions will be posted to the City's website under this project number no later Wednesday, January 21, 2015.

Sincerely,



Derrick F. Jones
Department of Purchases & Supplies

Enclosure

All additional proposal documents, requirements, addendums, specifications and plans/drawings (if utilized) are available on the Purchasing page of the City of Flint's web site at "http://cityofflint.com/?page_id=4694" under "open bids" and the specific bid or proposal number assigned to this notice.

INSTRUCTIONS TO VENDORS

General

- 1) **PRE-BID INFORMATION AND QUESTIONS:** Each bid that is timely received will be evaluated on its merit and completeness of all requested information. In preparing bids, Bidders are advised to rely only upon the contents of this Request for Proposal (RFP) and accompanying documents and any written clarifications or addenda issued by the City of Flint. If a Bidder finds a discrepancy, error or omission in the RFP package, or requires any written addendum thereto, the Bidder is requested to notify the Purchasing contact noted on the cover of this RFP, so that written clarification may be sent to all prospective Bidders. **THE CITY OF FLINT IS NOT RESPONSIBLE FOR ANY ORAL INSTRUCTIONS.**
- 2) **RFP MODIFICATIONS:** The City of Flint has the right to correct, modify or cancel the RFP, in whole or in part, or to reject any Bid, in whole or in part, within the discretion of the City of Flint, or their designee. If any such changes are made, all known recipients of the RFP will be sent a copy of such changes. If any changes are made to this RFP document by any party other than the City of Flint, the original document in the City of Flint's files takes precedence.
- 3) **BID SUBMISSION:**
 - a) The Bidder must include the following items, or the bid may be deemed non-responsive:
i.e. All forms contained in this RFP, fully completed.
 - b) Bids must be submitted to the Purchasing Department, City of Flint, 1101 S. Saginaw Street – Room 304, Flint, Michigan 48502 by the date and time indicated as the deadline. The Purchasing Department's time stamp will determine the official receipt time. It is each Bidder's responsibility to insure that its bid is time stamped by the Purchasing Department by the deadline. This responsibility rests entirely with the Bidder, regardless of delays resulting from postal handling or for any other reasons. Bids will be accepted at any time during the normal course of business only, said hours being 8:00 a.m. to 5:00 p.m. Local Time, Monday through Friday, legal holidays as exception.
 - c) Bids must be enclosed in a sealed opaque envelope, box or package, and clearly marked on the outside with the following: RFP Title, RFP Number, Deadline and Bidder's name.
 - d) Submission of a bid establishes a conclusive presumption that the Bidder is thoroughly familiar with the Request for Bids (RFP), and that the Bidder understands and agrees to abide by each and all of the stipulations and requirements contained therein.
 - e) All prices and notations must be typed or printed in ink. No erasures are permitted. Mistakes may be crossed out and corrections must be initialed in ink by the person(s) signing the bid.
 - f) Bids sent by telegraph, facsimile, or other electronic means will not be considered unless specifically authorized in this RFP.
 - g) All costs incurred in the preparation and presentation of the bid are the Bidder's sole responsibility; no pre-bid costs will be reimbursed to any Bidder. All documentation submitted with the bid will become the property of the City of Flint.
 - h) Bids must be held firm for a minimum of 120 days.
 - i) Term - Contract and/or all other procurement documents shall be effective until completed to the satisfaction of the City of Flint. The City of Flint reserves the right to cancel or not renew all or any part of the procurement agreement/contract at any time.

- 4) **EXCEPTIONS:** Bidder shall clearly identify any proposed deviations from the Terms or Scope in the Request for Bid. Each exception must be clearly defined and referenced to the proper paragraph in this RFP. The exception shall include, at a minimum, the Bidder's proposed substitute language and opinion as to why the suggested substitution will provide equivalent or better service and performance. If no exceptions are noted in the Bidder's bid, the City of Flint will assume complete conformance with this specification and the successful Bidder will be required to perform accordingly. Bids not meeting all requirements may be rejected.
- 5) **DUPLICATE BIDS:** No more than one (1) bid from any Bidder, including its subsidiaries, affiliated companies and franchises will be considered by the City of Flint. In the event multiple bids are submitted in violation of this provision, the City will have the right to determine which bid will be considered, or at its sole option, reject all such multiple bids.
- 6) **WITHDRAWAL:** Bids may only be withdrawn by written notice prior to the date and time set for the opening of bids. No Bid may be withdrawn after the deadline for submission.
- 7) **REJECTION/GOOD STANDING:** The City of Flint reserves the right to reject any or all bids, or to accept or reject any bid in part, and to waive any minor informality or irregularity in bids received if it is determined by the City of Flint, or their designee, that the best interest of the City will be served by doing so. No Bid will be considered from any person, firm or corporation in arrears or in default to the City on any contract, debt, taxes or other obligation, or if the Bidder is debarred by the City of Flint from consideration for a contract award.
- 8) **PROCUREMENT POLICY:** Procurement for the City of Flint will be handled in a manner providing fair opportunity to all businesses. This will be accomplished without abrogation or sacrifice of quality and as determined to be in the best interest of the City. The City of Flint and their officials have the vested authority to execute a contract, subject to City Council and Mayoral approval where required.
- 9) **BID SIGNATURES:** Bids must be signed by an authorized official of the Bidder. Each signature represents binding commitment upon the Bidder to provide the goods and/or services offered to the City of Flint if the Bidder is determined to be the lowest Responsive and Responsible Bidder.
- 10) **CONTRACT AWARD/SPLIT AWARDS:** The City of Flint reserves the right to award by item, group of items, or total bid to the lowest responsive, responsible Bidder. The Bidder to whom the award is made will be notified at the earliest possible date. Tentative acceptance of the bid, intent to recommend award of a contract, and actual award of the contract will be provided by written notice sent to the Bidder at the address designated in the bid if a separate Agreement is required to be executed. After a final award of the Agreement by the City of Flint, the Contractor/Vendor must execute and perform said Agreement. All bids must be firm for at least 120 days from the due date of the bid. If, for any reason, a contract is not executed with the selected Bidder within 14 days after notice of recommendation for award, then the City may recommend the next lowest responsive and responsible Bidder.
- 11) **NO RFP RESPONSE:** Bidders who receive this RFP but who do not submit a bid should return this RFP package stating the reason(s) for not responding. Failure to return this form may result in removal of the Bidder's name from all bidder lists.

- 12) **FREEDOM OF INFORMATION ACT REQUIREMENTS:** Bids are subject to public disclosure after the deadline for submission in accordance with state law.
- 13) **ARBITRATION:** Contractor/Vendor agrees to submit to arbitration all claims, counterclaims, disputes and other matters in question arising out of or relating to this agreement or the breach thereof. The Contractor's agreement to arbitrate shall be specifically enforceable under the prevailing law of any court having jurisdiction to hear such matters. Contractor's obligation to submit to arbitration shall be subject to the following provisions:
- (a) Notice of demand for arbitration must be submitted to the City in writing within a reasonable time after the claim, dispute or other matter in question has arisen. A reasonable time is hereby determined to be fourteen (14) days from the date the party demanding the arbitration knows or should have known the facts giving rise to his claim, dispute or question. In no event may the demand for arbitration be made after the time when institution of legal or equitable proceedings based on such claim dispute or other matters in question would be barred by the applicable statute of limitation.
 - (b) Within fourteen (14) days from the date demand for arbitration is received by the City, each party shall submit to the other the name of one person to serve as an arbitrator. The two arbitrators together shall then select a third person; the three together shall then serve as a panel in all proceedings. Any decision concurred in by a majority of the three shall be a final binding decision.
 - (c) The final decision rendered by said arbitrators shall be binding and conclusive and shall be subject to specific enforcement by a court of competent jurisdiction.
 - (d) The costs of the arbitration shall be split and borne equally between the parties and such costs are not subject to shifting by the arbitrator.
- 14) **BID HOLD:** The City of Flint may hold bids for a period of 120 days from opening, for the purpose of reviewing the results and investigating the qualifications of bidders prior to making an award.
- 15) **NONCOMPLIANCE:** Failure to deliver in accordance with specifications will be cause for the City of Flint and they may cancel the contract or any part thereof and purchase on the open market, charging any additional cost to the Contractor/Vendor.
- 16) **DISCLAIMER OF CONTRACTUAL RELATIONSHIP:** Nothing contained in these documents shall create any contractual relationship between the City and any Subcontractor or Sub-subcontractor.
- 17) **ERRORS AND OMISSIONS:** Bidder is not permitted to take advantage of any obvious errors or omissions in specifications.
- 18) **INTERPRETATION:** In the event that any provision contained herein shall be determined by a court of competent jurisdiction or an appropriate administrative tribunal to be contrary to the provision of law or to be unenforceable for any reason, then, to the extent necessary and possible to render the remainder of this Agreement enforceable, such provision may be modified or severed by such court or administrative tribunal having jurisdiction over this Agreement and the interpretation thereof, or the parties hereto, so as to, as nearly as possible, carry out the intention of the parties hereto, considering the purpose of the entire Agreement in relation to such provision.

- 19) **LAWS AND ORDINANCES:** The bidder shall obey and abide by all of the laws, rules and regulations of the Federal Government, State of Michigan, Genesee County and the City of Flint, applicable to the performance of this agreement, including, but not limited to, labor laws, and laws regulating or applying to public improvement, local government, and its operational requirements.
- 20) **LOCAL PREFERENCE:** Bidders located within the corporate city limits of Flint, Michigan may be given a seven percent (7%) competitive price advantage and those located in Genesee County, MI may be given a three and a half percent (3 ½%) competitive price advantage.
- 21) **MATERIAL WORKMANSHIP AND STANDARDS OF PERFORMANCE:** The bidder agrees to exercise independent judgment and to complete performance under this Agreement in accordance with sound professional practices. In entering into this Agreement, the City is relying upon the professional reputation, experience, certification and ability of the bidder. The bidder agrees that all of the obligations required by him pursuant to this Agreement shall be performed by him or by other employed by him and working under his direction and control. The continued effectiveness of this Agreement during its term or any renewal term shall be contingent, in part, upon the bidder maintaining his operating qualifications in accordance with the requirements of federal, state and local laws. All materials furnished must be new, of latest model and standard first grade quality, or best workmanship and design, unless otherwise expressly specified. Bidder, if required, must furnish satisfactory evidence of quality materials; offers of experimental or unproven equipment may be disregarded.
- 22) **MODIFICATIONS/CHANGES/PRICE VARIATIONS:** Any modification to this agreement must be in writing and signed by the authorized employee, officer, board or council representative authorized to make such modifications pursuant to the State law and local ordinances. Commodities subject to market price variation shall be considered on all term agreements subject to a 30-day advance written notification from the vendor. Such notice must be substantiated by a written price change from the manufacturer and shall be required for both price increases and decreases.
- 23) **NON-COLLUSION:** The bidder acknowledges that by signing this document that he/she is duly authorized to make said offer on behalf of the company he/she represents and that said bid is genuine and not sham or collusive and not made in the interests or on behalf of any person not therein named, and that he/she and said bidder have not directly induced or solicited any other person(s) or corporation to refrain from responding to this solicitation and that he/she and said bidder have not in any manner sought by collusion to secure to himself/herself and said bidder any advantage over any other bidder.
- 24) **NON-DISCRIMINATION:** Pursuant to the requirements of 1976 P.A. 453 (Michigan Civil Rights Act) and 1976 P.A. 220 (Michigan Handicapped Rights Act), the local unit and its agent agree not to discriminate against any employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment or a matter directly or indirectly related to employment because of race, color, religion, national origin, age, sex, height, weight, marital status or because of a handicap that is unrelated to the person's ability to perform the duties of nondiscrimination provision identical to this provision and binding upon any and all contractors and subcontractors. A breach of this covenant shall be regarded as a material breach of this contract.

- 25) **SUBCONTRACTING:** No subcontract work shall be started prior to the written approval of the subcontractor by the City. The City reserves the right to accept or reject any subcontractor.
- 26) **UNION COMPLIANCE:** Contractor agrees to comply with all regulations and requirements of any national or local union(s) that may have jurisdiction over any of the materials, facilities, services or personnel to be furnished by the City.
- 27) **WAIVER:** Failure of the City to insist upon strict compliance with any of the terms, covenants or conditions of this Agreement shall not be deemed a waiver of that term, covenant or condition or of any other term, covenant or condition. Any waiver or relinquishment of any right or power hereunder at any one or more times shall not be deemed a waiver or relinquishment of that right or power at any other time.
- 28) **JURISDICTION OF OMBUDSMAN:** Any person, business or other entity submitting a bid or bid in response to a request by the City consents to be subject to the jurisdiction of the Ombudsman of the City of Flint and to comply with the respective Charter provisions governing the Ombudsman's duties, jurisdiction and powers.
- 29) **PREVAILING WAGE:** The successful bidder providing any contractual labor services must comply with all requirements and pay prevailing wages and fringe benefits on this project per the City's Resolution R-12 adopted 4/8/91. The bidder is aware of City of Flint Resolution #R-12 dated April 8, 1991, a copy of which is annexed hereto and incorporated herein, and agrees to abide by all of the applicable covenants and requirements set forth in said resolution. Not applicable to this project.
- 30) **CITY INCOME TAX WITHHOLDING:** Contractor and any subcontractor engaged in this contract shall withhold from each payment to his employees the City income tax on all of their compensation subject to tax, after giving effect to exemptions, as follows:
- (a) Residents of the City:
At a rate equal to 1% of all compensation paid to the employee who is a resident of the City of Flint.
 - (b) Non-residents:
At a rate equal to 1/2% of the compensation paid to the employee for work done or services performed in the City of Flint.

These taxes shall be held in trust and paid over to the City of Flint in accordance with City ordinances and State law. Any failure to do so shall constitute a substantial and material breach of this contract.

- 31) **CONTRACT/PROCUREMENT DOCUMENTS:** The invitation for bids, instructions to bidders, bid, affidavit, addenda (if any), statement of bidder's qualifications (when required), general conditions, special conditions, performance bond, labor and material payment bond, insurance certificates, (if required), technical specifications, and drawings, together with this agreement, form the contract, and they are as fully a part of the contract as if attached hereto or repeated herein.
- 32) **DISCLAIMER OF CONTRACTUAL RELATIONSHIP WITH SUBCONTRACTORS:** Nothing contained in the Contract Documents shall create any contractual relationship between the City and any Subcontractor or Sub-subcontractor.
- 33) **EFFECTIVE DATE:** Any agreement between the City and the contractor shall be effective upon the date that it is executed by all parties hereto.

- 34) **FORCE MAJEURE:** Neither party shall be responsible for damages or delays caused by Force Majeure or other events beyond the control of the other party and which could not reasonably have anticipated the control of the other party and which could not reasonably have been anticipated or prevented. For purposes of this Agreement, Force Majeure includes, but is not limited to, adverse weather conditions, floods, epidemics, war, riot, strikes, lockouts, and other industrial disturbances; unknown site conditions, accidents, sabotage, fire, and acts of God. Should Force Majeure occur, the parties shall mutually agree on the terms and conditions upon which the services may continue.
- 35) **INDEMNIFICATION:** To the fullest extent permitted by law, Contractor agrees to defend, pay on behalf of, indemnify, and hold harmless the City of Flint, its elected and appointed officials, employees and volunteers and other working on behalf of the City of Flint, including the Project Manager, against any and all claims, demands, suits, or losses, including all costs connected therewith, and for any damages which may be asserted, claimed, or recovered against or from the City of Flint, its elected and appointed officials, employees, volunteers or others working on behalf of the City of Flint, by reason of personal injury, including bodily injury or death and/or property damage, including loss of use thereof, which may arise as a result of Contractor's acts, omissions, faults, and negligence or that of any of his employees, agents, and representatives in connection with the performance of this contract. Should the Contractor fail to indemnify the City in the above-mentioned circumstances, the City may exercise its option to deduct the cost that it incurs from the contract price forthwith.
- 36) **INDEPENDENT CONTRACTOR:** No provision of this contract shall be construed as creating an employer-employee relationship. It is hereby expressly understood and agreed that Contractor is an "independent contractor" as that phrase has been defined and interpreted by the courts of the State of Michigan and, as such, Contractor is not entitled to any benefits not otherwise specified herein.
- 37) **NO THIRD-PARTY BENEFICIARY:** No contractor, subcontractor, mechanic, material man, laborer, vendor, or other person dealing with the principal Contractor shall be, nor shall any of them be deemed to be, third-party beneficiaries of this contract, but each such person shall be deemed to have agreed (a) that they shall look to the principal Contractor as their sole source of recovery if not paid, and (b) except as otherwise agreed to by the principal Contractor and any such person in writing, they may not enter any claim or bring any such action against the City under any circumstances. Except as provided by law, or as otherwise agreed to in writing between the City and such person, each such person shall be deemed to have waived in writing all rights to seek redress from the City under any circumstances whatsoever.
- 38) **NON-ASSIGNABILITY:** Contractor shall not assign or transfer any interest in this contract without the prior written consent of the City provided, however, that claims for money due or to become due to Contractor from the City under this contract may be assigned to a bank, trust company, or other financial institution without such approval. Notice of any such assignment or transfer shall be furnished promptly to the City.
- 39) **NON-DISCLOSURE/CONFIDENTIALITY:** Contractor agrees that the documents identified herein as the contract documents are confidential information intended for the sole use of the City and that Contractor will not disclose any such information, or in any other way make such documents public, without the express written approval of the City or the order of the court of appropriate jurisdiction or as required by the laws of the State of Michigan.
- 40) **RECORDS PROPERTY OF CITY:** All documents, information, reports and the like prepared or generated by Contractor as a result of this contract shall become the sole property of the City of Flint.
- 41) **SEVERABILITY:** In the event that any provision contained herein shall be determined by a court or administrative tribunal to be contrary to a provision of state or federal law or to be unenforceable for any reason, then, to the extent necessary and possible to render the remainder of this Agreement enforceable, such provision may be modified or severed by such court or administrative tribunal so as

to, as nearly as possible, carry out the intention of the parties hereto, considering the purpose of the entire Agreement in relation to such provision. The invalidation of one or more terms of this contract shall not affect the validity of the remaining terms.

- 42) **TERMINATION:** This contract may be terminated by either party hereto by submitting a notice of termination to the other party. Such notice shall be in writing and shall be effective 30 days from the date it is submitted unless otherwise agreed to by the parties hereto. Contractor, upon receiving such notice and prorated payment upon termination of this contract shall give to the City all pertinent records, data, and information created up to the date of termination to which the City, under the terms of this contract, is entitled.
- 43) **TIME PERFORMANCE:** Contractor's services shall commence immediately upon receipt of the notice to proceed and shall be carried out forthwith and without reasonable delay.
- 44) **EVALUATION OF BIDS/BIDS:** The City's evaluation of these proposals will be based on the criterion of price, experience, qualifications, capacity, and ability to produce the required deliverables at an accelerated pace.

Insurance/Worker's Compensation: Contractor shall not commence work under this contract until he has procured and provided evidence of the insurance required under this section. All coverage shall be obtained from insurance companies licensed and authorized to do business in the State of Michigan unless otherwise approved by the City's Risk Manager. Policies shall be reviewed by the City's Risk Manager for completeness and limits of coverage. All coverage shall be with insurance carriers acceptable to the City of Flint. Contractor shall maintain the following insurance coverage for the duration of the contract.

(a) Commercial General Liability coverage of not less than one million dollars (\$1,000,000) combined single limit with the City of Flint, and including all elected and appointed officials, all employees and volunteers, all boards, commissions and/or authorities and their board members, employees and volunteers, named as "Additional Insured." This coverage shall be written on an ISO occurrence basis form and shall include: Bodily Injury, Personal Injury, Property Damage, Contractual Liability, Products and Completed Operations, Independent Contractors; Broad Form Commercial General Liability Endorsement, (XCU) Exclusions deleted and a per contract aggregate coverage. This coverage shall be primary to the Additional Insured, and not contributing with any other insurance or similar protection available to the Additional Insured, whether said other available coverage be primary, contributing, or excess.

(b) Workers Compensation Insurance in accordance with Michigan statutory requirements, including Employers Liability coverage.

(c) Commercial Automobile Insurance in the amount of not less than \$1,000,000 combined single limit per accident with the City of Flint, and including all elected and appointed officials, all employees and volunteers, all boards, commissions and/or authorities and their board members, employees and volunteers, named as "Additional Insured." This coverage shall be written on ISO business auto forms covering Automobile Liability, code "any auto."

(d) Professional Liability - Errors and Omissions. All projects involving the use of Architects, civil engineers, landscape design specialists, and other professional services must provide the City of Flint with evidence of Professional Liability coverage in an amount not less than one million dollars (\$1,000,000). Evidence of this coverage must be provided for a minimum of three years after project completion. Any deductibles or self-insured retention must be declared to and approved by the City. In addition, the total dollar value of all claims paid out on the policy shall be declared. At the option of the City, either the insurer shall reduce or eliminate such deductibles or self-insured retention with respect to the City, its officials, employees, agents and volunteers; or Contractor shall procure a bond guaranteeing payment of losses and related investigation, claim, administration, and defense expenses.

Contractor shall furnish the City with two certificates of insurance for all coverage requested with original endorsements for those policies requiring the Additional Insured. All certificates of insurance must provide the City of Flint with not less than 30 days advance written notice in the event of cancellation, non-payment of premium, non-renewal, or any material change in policy coverage. In addition, the wording "Endeavor to" and "but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives" must be removed from the standard ACORD cancellation statement. These certificates must identify the City of Flint, as the "Certificate Holder." Contractor must provide, upon request, certified copies of all insurance policies. If any of the above policies are due to expire during the term of this contract, Contractor shall deliver renewal certificates and copies of the new policies to the City of Flint at least ten days prior to the expiration date. Contractor shall ensure that all subcontractors utilized obtain and maintain all insurance coverage required by this provision.

Background Information

On May 1, 2014 the City of Flint (the City) completed a transition to using water provided by Detroit Water and Sewer Department to drawing water from the Flint River and utilizing our plant to treat and distribute the water. In the subsequent months, many of the eight testing sites around the City were returning low chlorine residual levels and several of those sites developed into positive tests for total coliform and resulted in the issuance of boil water notices for precautionary measures. Numerous valve replacements and additional chlorination resulting in more consistent chlorine residuals throughout the system.

Quarterly reporting to the Michigan Department of Environmental Quality (MDEQ) of Disinfectant Byproduct Levels resulted in trihalomethane levels above the maximum contaminant level (MCL). Seven of eight test sites are currently below the MCL but the annual average has triggered a violation notice from the MDEQ dated December 16, 2014. The City has worked with an engineering team to develop an Operational Evaluation Report (see Exhibit A) as required by the violation and has submitted that report to the MDEQ. The next testing period is scheduled for the middle of February 2015 and an updated Operational Evaluation report which incorporates the results of that test is due to the MDEQ no later than March 1, 2015.

The City is anticipating during the middle of 2016 to begin receiving and treating raw water from Lake Huron via the Karegnondi Water Authority (KWA). The City's Water Plant will still be capable of drawing water from the Flint River and will need to be proficient in treating both bodies of water. It is planned that the Flint River will be a permanent back-up source in providing water to the citizens of Flint.

Scope of Services

The City is seeking a consultant to review and evaluate the water treatment process and distribution system, provide recommendations to maintain compliance with both state and federal agencies, and assist in implementing accepted recommendations. The City will have the selected vendor provide reports to reflect their findings and provide continual oversight in implementing any approved recommended practices to improve the quality of water until implementation of the KWA project.

Deliverables

The City is requesting that the selected vendor provide the following reports in their order of appearance:

- Evaluation of the City's processes and procedures to maintain and improve water quality;
- Report that outlines recommendations that will improve the water treatment and distribution system.

The City is requesting that the selected vendor provide coordination in implementing any selected recommendations that will result in improving the overall process of treating and distributing water until such time that the City is receiving and successfully treating Lake Huron water.

Information Required to Submit Proposal

The City has deemed this project a priority and will be requesting the selected firm to produce the requested information in an expedient manner. Firms interested in submitting a proposal based on the information requested in this document must submit the following information:

- **Company's Information**-The proposal shall list the legal name of the firm, its address and phone number, and firm's history.
- **Firm Qualifications, Experiences and References**-The proposal should state the size of the firm, personnel that will be assigned to this project, and other significant projects performed in the past five years that are similar to this request for proposal. Indicate the scope of work provided and the name and telephone number of the client.
- **Staff Experience**-The proposal should provide information on each staff member to include experience, relevant education, degrees, certifications and any other pertinent information or a resume.
- **Project Scope** – Provide a statement discussing the firm's understanding of the requested services, potential obstacles that may occur during this project, and a work plan and timeline in preparing and submitting the requested deliverables.
- **Price for Services**-Vendor is to provide a pricing schedule to perform the requested services. Pricing should include a lump sum to provide the requested reports, an hourly rate schedule of personnel that will be utilized to perform the requested services, and a detail timeline that articulate the completion of the requested reports.

- **Other-**Please include any other information that you think would be helpful in allowing the City to make an informed decision in the selection process.

CITY OF FLINT, MICHIGAN

AFFIDAVIT

AFFIDAVIT FOR INDIVIDUAL

STATE OF

s.s.

COUNTY OF

.....being duly sworn, deposes and says that he is the person making the above bid; and that said bid is genuine and not sham or collusive, and is not made in the interest of or on behalf of any person not therein named, and that he has not directly or indirectly induced or solicited any bidder to put in a sham bid; that he has not directly or indirectly induced or solicited any other person or corporation to refrain from bidding, and that he has not in any manner sought by collusion to secure to himself any advantage over other bidders.

Subscribed and sworn to before me at, in said County and State,
this day of, A. D. 20.....,

My Commission expires, 20.....
*Notary Public,County,.....

FOR CORPORATION

STATE OF

s.s.

COUNTY OF

..... being duly sworn, deposes and says
that he is..... of
(Official Title) (Name of Corporation)

a corporation duly organized and doing business under the laws of the State of
the corporation making the within and foregoing bid; that he executed said bid in behalf of said corporation by authority of its Board of Directors; that said bid is genuine and not sham or collusive and is not made in the interests of or on behalf of any person not herein named, and that he has not and said bidder has not directly or indirectly induced or solicited any bidder to put in a sham bid; that he has not and said bidder has not directly or indirectly induced or solicited any other person or corporation to refrain from bidding; that he has not and said bidder has not in any manner sought by collusion to secure to himself or to said corporation an advantage over other bidders.

Subscribed and sworn to before me at, in said County and State,
this day of, A. D. 20.....,

My Commission expires....., 20.....
*Notary Public,County,.....

Exhibit A – Operational Evaluation Report

Operational Evaluation Report City of Flint



Trihalomethane Formation Concern

November 2014



Lockwood, Andrews
& Newnam, Inc.
A LEO GROUP COMPANY

CITY OF FLINT
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EXECUTIVE SUMMARY

Environmental Protection Agency (EPA) and Michigan Department of Environmental Quality (MDEQ) regulations require that public water suppliers test drinking water quarterly throughout the distribution system for disinfectant by-products (DBP's). Two categories of DBP's, tri-halomethanes (THM) and halo-acetic acids (HAA5), are regulated and must be tested for. The City of Flint began operation of their water treatment plant (WTP) full time with the Flint River as the source on April 25, 2014. Since that time, two quarters of samples taken indicate that future violations are inevitable for total THM without some modifications to the water system. In response, the City hired Lockwood, Andrews & Newnam, Inc. (LAN) to complete this Operational Evaluation Report (OER) in conformance with EPA guidelines with the goal to determine the cause(s) of high levels of THM and evaluate possible solutions.

The EPA promulgated the Stage 2 Disinfectants and Disinfection By-Products Rule (DBPR) in January 2006 which set maximum contaminant levels (MCLs) for total trihalomethanes (TTHM) and HAA5 based on an annual running average, tested quarterly, for a given sampling location. The City of Flint reports levels from 8 sampling test locations. Of the two quarterly sampling cycles since Flint began operating the WTP full time, HAA5 levels have been acceptable but TTHM levels have been high at all 8 sampling sites.

According to the Stage 2 DBPR, the annual average value requires 3 quarters of sampling data with the most current period counting twice. Therefore, the City of Flint has not yet experienced a violation of the TTHM MCL because only 2 quarters of data have been obtained. However, levels recorded indicate the likelihood of an MCL exceedance later this year.

A number of issues have been identified as possibly contributing to the high THM levels measured.

1. Inefficient ozone system functionality which has resulted in increased chlorine feed.
2. Upstream influences in terms of increased chlorine demand.
3. Bypass stream around softening contributed to chlorine demand.
4. Unlined cast iron pipes in the distribution system contributing to chlorine demand.
5. Recirculating water in the distribution system due to less than ideal configuration of Cedar Street and West Side pump stations.
6. Broken valves resulting in stagnant water in some areas.
7. High chlorine demand in filters.
8. High THM formation potential (THMFP) in source water.
9. Less than optimal removal of THM precursors.

ACTION PLAN

The City of Flint has signed an agreement with the Karegnondi Water Authority (KWA) to purchase raw water drawn from Lake Huron. The KWA system is currently under construction and expected to be operational by late 2016. The water supply from Lake Huron will have entirely different water quality characteristics from the Flint River and those characteristics are expected to yield drastically reduced DPB formation. With that, non-structural options to help reduce THM levels are much preferred over solutions requiring new construction. Therefore, two categories of actions have been devised: Stage 1 being actions that can be completed relatively quickly without major construction and Stage 2 consisting of either long term actions or solutions requiring major construction. The City has completed or intends to complete Stage 1 Actions by February 16, 2015, the week in which the next quarterly sampling is to be done. Stage 2 actions are to be implemented only if Stage 1



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actions are ineffective in adequately reducing TTHM levels and therefore Stage 2 is contingent upon the outcome of Stage 1.

Stage 1 – Immediate Actions

- Hire ozone system manufacturer to troubleshoot ozone system
- Bench scale jar testing
 - Match existing process and access possible areas of improvement
 - Simulate potential modifications to treatment process
 - Evaluate coagulation and flocculation polymer aid feeds to assist with TOC removal
- WTP operational changes
 - Discontinue softening bypass stream to reduce chlorine demand
 - Disinfection of filter beds to reduce chlorine demand
 - Possibly begin coagulation and flocculation polymer aid feeds to assist with TOC removal depending on bench scale test results
- Increase water main flushing efforts to minimize stagnant water
- Water system modeling to identify areas with high water age and potential solutions
 - Cedar Street Pump Station potential recirculation
 - West Side Pump Station potential recirculation
 - Storage tank volume use
 - Possible broken closed valve locations
 - Locations in need of flushing
 - Lower high water levels in storage tanks

Stage 2 – Contingent Actions

- Fix ozone system
- Start feeding coagulation and flocculation polymer aids to lower TOC, if not completed in Stage 1
- Convert to lime and soda ash softening
- Change disinfectant to chloramine or chlorine dioxide until KWA
- Install pre-oxidant feed at intake to optimize ozone disinfection
- Implement advanced treatment for THM precursor removal
- Increased main flushing based on water modeling results
- Continue valve replacements with water model assistance
- Emphasize cast iron pipes on water main replacement priority list





I. BACKGROUND

The City of Detroit Water and Sewer Department (DWSD) has historically provided drinking water for the City of Flint and Genesee County. In the late 1990's growing concern regarding the reliability of the DWSD supply prompted the City of Flint to upgrade their existing water treatment plant (WTP). Those improvements, defined as Phase I, were completed in 2005 and were intended to allow the Flint WTP to operate, using the Flint River as the source, for an extended period of time in the event that supply from the DWSD was temporarily interrupted. Additionally, the Phase I improvements set the stage for Flint to break free from dependence on the DWSD supply and water charges over which they had no control.

A. WATER SUPPLY TRANSITION

1. Detroit Water and Sewer Department (DWSD)

Until recently the Genesee County and Flint region had been provided drinking water by the DWSD. However, due to excessive cost increases and reliability issues with the DWSD system other options had to be explored.

2. Karegnondi Water Authority (KWA)

In 2010 the Karegnondi Water Authority (KWA) was formed for the purpose of developing a new water supply from Lake Huron to serve the region in lieu of the DWSD supply and the City of Flint elected to join. The KWA expects the new system which is currently being constructed to become operational in the fall of 2016.

3. Flint River – Interim Period

With a renewing water supply agreement between Flint and the DWSD being terminated by the DWSD (effective April 30, 2014) and the KWA system not expected to be operational until late 2016, the City of Flint decided to initiate operation of the existing WTP full time utilizing the Flint River as the interim water source. A variety of WTP improvements were necessary for the Flint plant to become a full time plant. For purposes of this report, Phase II improvements to the Flint WTP are improvements which have been made to allow the plant to operate full time with either the Flint River as the source or the KWA supply as the source.

B. TTHM PENDING VIOLATIONS

The calculation for determining if the MCL has been violated for TTHM is:

$$(2 \times \text{current quarter value} + \text{previous 2 quarter values}) / 4$$

Flint has completed tests for 2 quarters and therefore has not violated an MCL limit to date. However, the third quarter of sample data is likely to provide MCL exceedances at all 8 sampling sites. Test results are tabulated below.

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TABLE 1 – 2014 DBP TEST RESULTS

Sample Location	TTHM			HAA5		
	1 st Qrt 5/21/14	2 nd Qrt 8/21/14	3 rd Qrt	1 st Qrt 5/21/14	2 nd Qrt 8/21/14	3 rd Qrt
1) 3719 Davison - McDonalds	162.4	145.3		64	43	
2) 822 S. Dort Hwy - BP Gas Sta.	111.6	112.0		52	40	
3) 3302 S. Dort Hwy - Liquor Pal.	96.5	127.2		48	31	
4) 3606 Corunna - Taco Bell	106.4	181.3		55	24	
5) 2501 Flushing - Univ. Market	75.1	196.2		38	17	
6) 3216 MLK - Salem Housing	82.2	112.4		41	25	
7) 5018 Clio - Rite Aid	88.2	144.4		49	30	
8) 6204 N. Saginaw - N. Flint Auto	79.2	118.3		50	37	

TTHM MCL = 80 ug/l

HAA5 MCL = 60 ug/l

C. WATER TREATMENT PLANT RECENT IMPROVEMENTS & STATUS

1. Phase I WTP Improvements

Since 1965, the Flint WTP has remained a secondary or backup supply system to the DWSD primary supply. Typically the secondary supply for a public water system is expected to be needed only during emergency situations and normally is designed for short term operation such as providing the average daily demand for a few days. Conversely, Phase I improvements were designed with the intent to upgrade the Flint WTP in order to allow for an extended short term period (6 weeks) because of the perceived high risk that the DWSD supply would fail and remain out of service for an extended duration. Regardless, the Flint WTP was still intended to serve as a standby plant and as such the Phase I improvements lacked redundancies that would be required for a primary supply WTP.

2. Past Pilot Study & Testing

During design of the Phase I improvements a treatability study was completed by Alvord, Burdick & Howson, LLC (AB&H) in 2002. The Treatability Study evaluated the current treatment processes that are in place at the Flint WTP today with the Flint River as the source. The report recommended the following:

TABLE 2 – 2002 WTP TREATMENT RECOMMENDATIONS

Treatment	Purpose	Point of Application	Dosage (mg/l)
Sodium permanganate	Zebra mussel control	Intake	0.3
Ozone	Taste & odor removal, disinfection	Diffuser basin	1.5
Ferric chloride	Coagulation	Rapid mix	40
Coag aid polymer	Turbidity & FOC removal	Rapid mix	2.0
Floc aid polymer	Turbidity & FOC removal	Floc basin	0.05
Lime	Softening	Softening basin	175
Soda ash	Softening	Softening basin	52
Carbon dioxide	pH adjustment	Recarb basin	37
Media filters	Filtration	Na	Na
Chlorine	Disinfection	Filter effluent	1.0





Of the recommended items, zebra mussel control, coagulant and flocculation polymer aids, and soda ash feed have not been incorporated into the treatment process.

3. Phase II WTP Improvements for Full Time Operation

Phase II WTP improvements are those needed to convert the Flint WTP from a back-up supply to a primary supply plant. A number of improvements have already been constructed as they were necessary to operate full time, treating water from the Flint River. The improvements under the title of Phase II that have been completed or are nearly complete include upgrades to the lime sludge lagoon, the lime sludge lagoon decant and disposal system, decant pump station and force main, installation of mid-point chlorination before filtration, and upgrade of the electric feed sub-station.

Additional improvements to the Flint WTP that are to be completed to become part of the normal treatment process using water supplied by the KWA are:

- New oxygen and nitrogen storage facilities for the ozone system (under construction)
- New coagulant feed system
- Electrical
 - Pump Station #4 upgrades (under construction)
 - SCADA and controls upgrades
 - Filter transfer pump station feeders
- Installation of the future raw water feed connection point for the KWA (under construction)
- Pump replacements and VFD installation in the low and high service pump station (under construction)
- Filter transfer pump station to Dort Reservoir
- Facility security improvements





II. SOURCE WATER EVALUATION

A. DATA ANALYSIS

Based on past data collected and the 2002 Treatability Study by AB&H, the Flint River water quality varies seasonally with higher hardness and alkalinity experienced in the winter. Higher magnesium concentrations are also experienced in the winter, adding difficulty to the settling process due to neutrally buoyant floc. General water quality average characteristics recorded for the 2002 Treatability Study as compared with average characteristics recorded this year are shown in Table 3 below.

TABLE 3 – FLINT RIVER WATER QUALITY CHARACTERISTICS						
Period	Turbidity NTU	TOC Mg/l	Alkalinity Mg/l	Hardness Mg/l as CaCO ₃	pH	Total Col. Count/day
2001 Apr–Oct	7.9	9.4	215	272	8.1	870-1230 (7300 max)
2014 May–Oct	8.3	10.3 5/22/14	207	252	8.2	1900-9000 (48,300 max)

Other than total Coliform, the Flint River characteristics do not appear to have changed significantly over the past 10+ years. Note that further investigation by City staff revealed a sewer leak upstream of the plant that may have contributed to the total Coliform count. The leak was subsequently repaired.

B. CONCLUSIONS

Considering the minor changes in Flint River water quality, much of the information contained in the 2002 Treatability Study by AB&H remains relevant today. Data from that report assumed to be consistent today include the following:

- Flint River is influenced by groundwater from a dolomitic aquifer
- Hardness varies seasonally with higher hardness and alkalinity in the winter
- Hardness, alkalinity, magnesium concentrations tend to be reduced by run-off
- Total THMFP is likely 380-440 micrograms per liter as measured between April 2001 and January 2002. The City intends to re-test the raw water to confirm the THMFP has not changed. Results are pending.

In development of the 2002 Treatability Study, processes were simulated which resulted in low THMFP. Therefore, information contained in that report will be used to assist with establishing a baseline jar testing procedure as discussed further in Section III.



III. TREATMENT PROCESS EVALUATION

A. EXISTING PROCESS DESCRIPTION

The existing WTP consists of an intake with screening from the Flint River, low lift pumping, ozonation, rapid mix, flocculation, settling, softening, recarbonation, filtration, storage and high service pumping. A process diagram is shown as Figure 1.

1. Intake

A 72" diameter pipe draws water from the Flint River through 2 traveling screens to the low lift pump structure. No chemicals are currently fed for Zebra mussel control or pre-oxidation as recommended by the 2002 Treatability Study. Manual removal of zebra mussels proved to be more economical than installation of chemical feed equipment considering the short term need.

2. Ozone

There are 2 ozone generators designed to provide adequate ozone for a WTP flow of up to 36 mgd. There are 3 ozone contact basins. The ozone generators were designed to produce 900 lbs/day at 10% concentration and up to 1300 lbs/day at 6% concentration each. Recent readings have indicated a production rate of approximately 700 lbs/day at 4% concentration. While serving the purposes of taste and odor control and disinfection, it is possible the current ozone feed might not be optimized to realize additional TOC removal benefits demonstrated by previous tests. Also, less than optimal ozonation has led to increased chlorine feed.

3. Rapid Mix

East and West rapid mix chambers allow chemical feed prior to the flocculation basins. Each rapid mix chamber is equipped with a 5 hp mixer.

4. Coagulation / Flocculation

The WTP contains two equally sized flocculation basins, east and west, and each basin provides tapered or gradually slowed mixing from inlet to outlet. There are fifteen 2 hp mixers for each basin with VFDs to control mixing speed. The 2002 Treatability Study recommended feeding both coagulation and flocculation polymer aids. Neither polymer aid is being used today because turbidity and TOC removals have been sufficient to meet regulatory requirements.

5. Settling

Primary clarification takes place within 3 basins containing plate settlers. The settlers are operating as designed.

6. Softening

Again, there are two basins for softening: east and west. Each basin is 120' in diameter and contains a solids contact softening unit. Each softening basin/unit has a design capacity of 18 mgd. Low lift pumping limitations, flow control to the basins, and fluctuating demands have made it difficult for WTP staff to stabilize the softening process. Softening is accomplished by feeding lime. The decision was made by the City not to feed soda ash in order to remove non-carbonate hardness because acceptable hardness levels could be achieved with lime feed only and softening is short term until Lake Huron water becomes available.



7. Recarbonation

Recarbonation for pH adjustment is accomplished in east and west recarbonation basins between and to the north of the softening basins. Carbon dioxide storage and feed equipment is located west of the recarbonation basins.

8. Filtration

Filtration is accomplished with 12 dual media filters, equally sized and designed to filter 3.0 mgd each. Media consists of 12" of sand and 18" of anthracite. The filters have been operated intermittently over the years due to the standby nature of the WTP and until recently, chlorine injection took place downstream of the filters. It is possible some microbial growth has developed in the filters.

9. Disinfection

Limited disinfection is provided by ozonation, but the primary form of disinfection is chlorine fed prior to filtration and prior to finish water storage / high service pumping. The intermediate chlorine injection location was recently constructed under the Phase II, Segment 1 contract.

10. Clear Well & Pumping

The pump building sits adjacent to a 3 MG clear well and contains both low and high service pumps.

B. JAR TESTS / EXPERIMENTS

1. Approach

There are several well practiced methods by which DBPs can be reduced. First, the disinfectant can be changed to an alternate that has a lower tendency to form DBPs. Second, additional treatment systems such as activated carbon or air stripping (depending on the nature of the precursors) can be added to remove DBP precursors. Lastly, the existing treatment processes can be optimized to remove as much DBP precursor as possible. Of these options, optimizing existing treatment processes is the only strategy that does not require the construction of new and expensive facilities. It is anticipated that Flint will be receiving Lake Huron water in approximately two years and this water will have a completely different chemistry from the Flint River. Major process changes instituted to address THM levels using Flint River water are likely to be unnecessary for Lake Huron water and may even be inappropriate. Therefore, those options which require addition of new treatment processes are undesirable at this time. In recognition of this upcoming change in water source, this study will concentrate on improving the existing processes, rather than adding new ones. New treatment processes will only be recommended if operational changes to the existing treatment train prove ineffective.

Recent sample test results suggest that most of the DBPs are formed in the distribution system rather than within the treatment plant. Therefore, the most logical approach is to reduce the DBP formation potential (DBPFP) rather than simply lowering the levels of DBPs leaving the plant. During bench scale testing, formation potential (FP) levels will be the primary indicator of success or failure of any proposed process modifications.

2. Protocol

Bench scale pilot testing is intended to reflect actual plant operating and hydraulic conditions so the bench scale treatment units will be sized based on various dimensionless factors to ensure the pilot treatment matches the actual system. Bench scale ozonation is not practical due to time and cost limitations. Therefore, water



samples will be withdrawn following the plant ozone basin. These samples will be transported to the laboratory where they will be dispensed into square testing jars. The jars will act as rapid mix, three-stage flocculation, and settling. Rapid mix and flocculation conditions will be matched to the plant based on "Gt" values. The "G" value is a measure of the mixing intensity and is a function of mix time, viscosity of the liquid, and mixing power applied to the water. "Gt" then, is a size scaling factor where time has been accounted for. Settling time will be scaled to match the shorter settling depth of the testing jars. After settling, samples will be decanted from the test jars. The decanted samples will then be lime softened; softening conditions will be similarly matched on the basis of "Gt". Fluoride will be added and carbon dioxide sparged into the samples to reduce the pH. The water will then be vacuum filtered through filter paper, sized to simulate the plant's dual media filters. The samples will be dosed with excess chlorine and allowed to react for seven days before testing for DBPs to determine the formation potential.

Although these conditions may be refined based on new information, we anticipate the following:

TABLE 4 – BENCH SCALE TEST MIXING INTENSITIES		
Process	G	Duration
Ozonation	Plant	-
Rapid Mix	350	25 sec
Flocculation, Stage 1	50	9 min
Flocculation, Stage 1	25	9 min
Flocculation, Stage 1	12	9 min
Settling	na	10 min
Softening	TBD	10 min
Recarbonation	na	na

It is expected that the primary variables during the testing will be chemical additions and chemical dosages. Specific chemicals and dosages used for initial testing conditions will be selected to reflect current plant usage and the recommendations of the 2002 Treatability Study.

TABLE 5 – BENCH SCALE TEST CHEMICAL FEED RATES		
Chemical	Current Usage	2002 Study
Ozonation	4.66 mg/l	1.5 mg/l
Ferric Chloride	7.7 mg/l	40 mg/l
Coagulant Aid Polymer	Not used	2.0 mg/l
Flocculation Aid Polymer	Not used	0.05 mg/l
Lime	120 mg/l	175 mg/l
Soda Ash	Not used	52 mg/l
Cationic Softening Polymer	3.13 mg/l	Not used
Anionic Softening Polymer	0.88 mg/l	Not used
Fluoride	0.45 mg/l	1 mg/l
Carbon Dioxide	32 mg/l	37 mg/l
Chlorine	6.3 mg/l	1 mg/l



3. Considerations

The 2002 Treatability Study did not note significant formation of DBPs. This may be a function of different Flint River water chemistry at that time. However, recognizing the considerable differences in chemical usage and dosages between that study and current operations, those differences in chemical use and dosage are an obvious starting point for optimizing treatment to prevent DBP limit exceedance.

Although it is believed that optimization of current treatment can correct the DBP issue, should optimization of present treatment prove insufficient, alternate residual disinfectants (chloramines and chlorine dioxide) will be investigated as additional treatment measures.

4. Results

[To be completed following jar testing and experimentation]

5. Conclusions

[To be completed following jar testing and experimentation]

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IV. DISTRIBUTION SYSTEM EVALUATION

EPA guidance for the distribution evaluation portion of an OER is focused on identification and isolation of a specific portion of the distribution system that led to the exceedance. The circumstances of Flint's apparent pending TTHM exceedances are unusual in that a new supply has been implemented which clearly corresponds to the high TTHM sample results. Despite obvious implications to the primary cause of increased TTHM levels, value remains in evaluating the distribution system as there may still be distribution improvements that can be made to help alleviate the problem.

Evaluation of the distribution system, including modeling, was recently added to LAN's scope of services. When finished, information will be provided to complete the following topics in this section.